WHAT IS CLAIMED IS:

1. A method for patterning dielectric layers on semiconductor substrates, comprising at least the steps of:

providing a first layer,

depositing at least one layer formed from a dielectric on the first layer, so that a dielectric layer is obtained;

depositing a photosensitive resist layer on the dielectric layer;

exposing and developing the resist layer in sections, so that a resist mask is obtained, through which sections of the dielectric layer are uncovered;

removing the dielectric layer in the sections which have been uncovered through the resist mask at least down to a depth which is such that the first layer is uncovered;

incinerating the resist mask in an oxygen plasma, the incineration being carried out at a temperature which is selected to be approximately 200°C or lower, and the oxygen plasma being generated from a gas which at least contains oxygen gas and a forming gas, the oxygen gas being present in an amount of approximately 60% or less by volume and the forming gas being present in an amount of approximately 40% or more by volume, so that a patterned dielectric layer is obtained; and

cleaning the patterned dielectric layer using aqueous dilute hydrofluoric acid.

- 2. The method of claim 1, wherein the duration of the step of incinerating the resist mask is selected to be between 30 s and 120 s.
- 3. The method of claim 1, wherein the oxygen partial pressure in the gas for generating the oxygen plasma is selected to be between 0.2 and 8.0 Torr.

- 4. The method of claim 1, wherein the forming gas at least contains nitrogen gas and hydrogen gas.
 - 5. The method of claim 1, wherein the first layer is composed of silicon.
- 6. The method of claim 5, wherein the dielectric layer comprises at least one layer composed of a silicate glass and/or a silicon carbide.
- 7. The method of claim 1, wherein the aqueous dilute hydrofluoric acid has an HF/H₂O concentration of less than 1:400.
- 8. The method of claim 2, wherein the duration of the step of cleaning the patterned dielectric layer using dilute hydrofluoric acid is selected to be less than 60 seconds.
- 9. The method of claim 8, wherein the dilute hydrofluoric acid comprises a buffer salt.
- 10. The method of claim 1, wherein a wet-chemical clean is carried out after the resist mask has been incinerated.
- 11. A method for patterning a dielectric layer on a semiconductor substrate, comprising:

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providing a first layer,

depositing a layer formed from a dielectric on the first layer, so that a dielectric layer is obtained;

depositing a photosensitive resist layer on the dielectric layer;

exposing and developing the resist layer in sections, so that a resist mask is obtained, through which sections of the dielectric layer are uncovered;

removing the dielectric layer in the sections which have been uncovered through the resist mask at least down to a depth which is such that the first layer is uncovered;

incinerating the resist mask in an oxygen plasma, the incineration being carried out at a temperature which is selected to be approximately 200°C or lower, and the oxygen plasma being generated from a gas which at least contains oxygen gas and a forming gas, so that a patterned dielectric layer is obtained; and

cleaning the patterned dielectric layer using aqueous dilute hydrofluoric acid.

- 12. The method of claim 11, wherein the duration of the step of incinerating the resist mask is selected to be between 30 s and 120 s.
- 13. The method of claim 11, wherein the oxygen partial pressure in the gas for generating the oxygen plasma is selected to be between 0.2 and 8.0 Torr.
- 14. The method of claim 11, wherein the forming gas at least contains nitrogen gas and hydrogen gas.

15. A method for patterning a dielectric layer on a semiconductor substrate, comprising:

providing a first layer,

depositing at least one layer formed from a dielectric on the first layer, so that a dielectric layer is obtained;

depositing a photosensitive resist layer on the dielectric layer;

exposing and developing the resist layer in sections, so that a resist mask is obtained, through which sections of the dielectric layer are uncovered;

removing the dielectric layer in the sections which have been uncovered through the resist mask at least down to a depth which is such that the first layer is uncovered; and

incinerating the resist mask in an oxygen plasma being generated from a gas which at least contains oxygen gas and a forming gas.

- 16. The method of claim 15, further comprising the step of cleaning the patterned dielectric layer using aqueous dilute hydrofluoric acid.
- 17. The method of claim 15, wherein the oxygen gas being present in an amount of approximately 60% or less by volume and the forming gas being present in an amount of approximately 40% or more by volume, so that a patterned dielectric layer is obtained.
- 18. The method of claim 17, wherein the oxygen partial pressure in the gas for generating the oxygen plasma is selected to be between 0.2 and 8.0 Torr.

- 19. The method of claim 17, wherein the forming gas at least contains nitrogen gas and hydrogen gas.
- 20. The method of claim 5, wherein the dielectric layer comprises at least one layer composed of a silicate glass and/or a silicon carbide.